

# RFQ Subcomponents

PXIE RFQ Fabrication Readiness Review  
LBNL - June 26, 2013

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**Steve Virostek - Engineering Division**  
Lawrence Berkeley National Laboratory



# Topics

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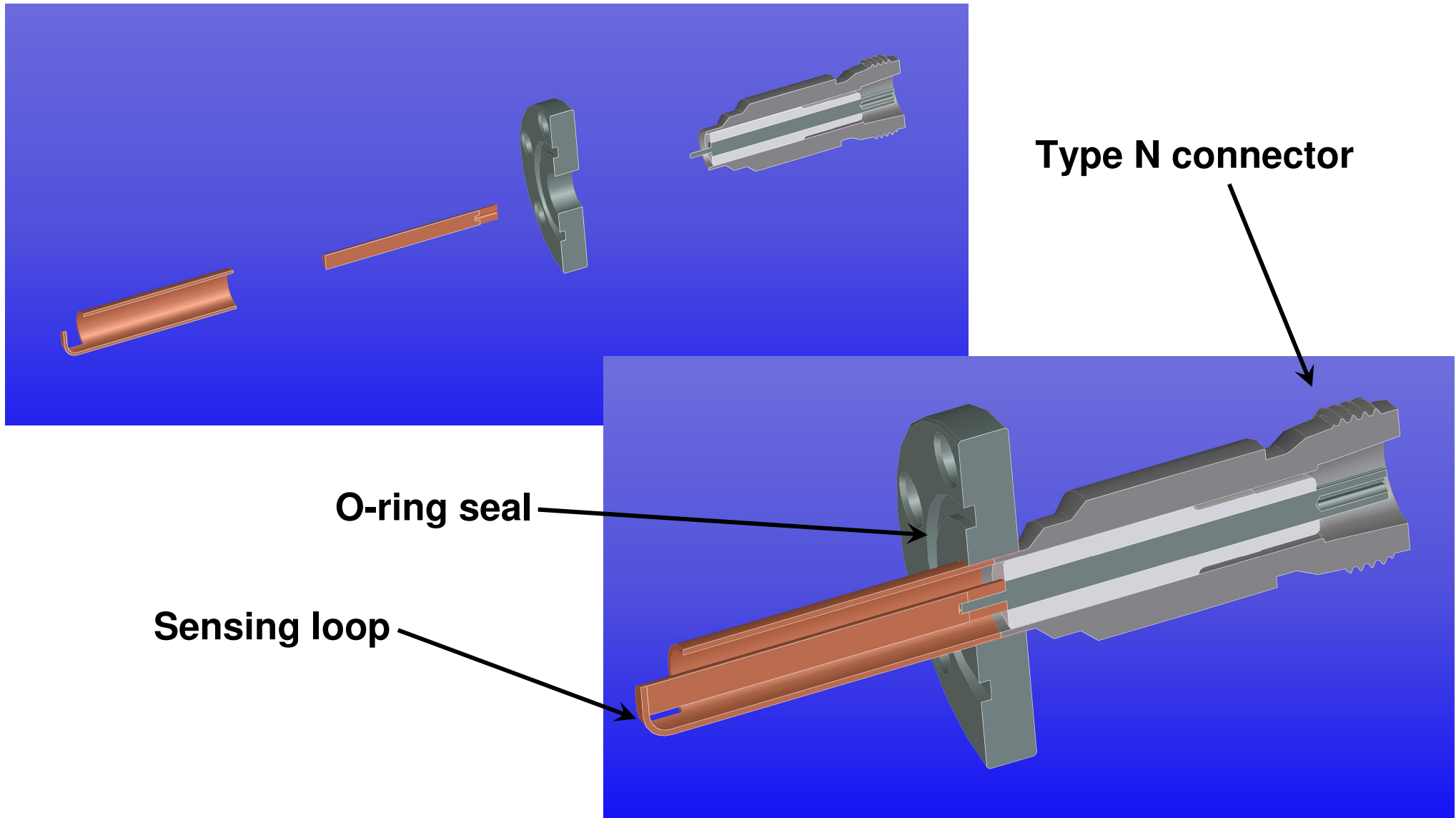
- RF sensing loops
- Adjustable bead pull tuners
- Tunable end blocks
- Support/assembly stand

# RF Sensing Loops

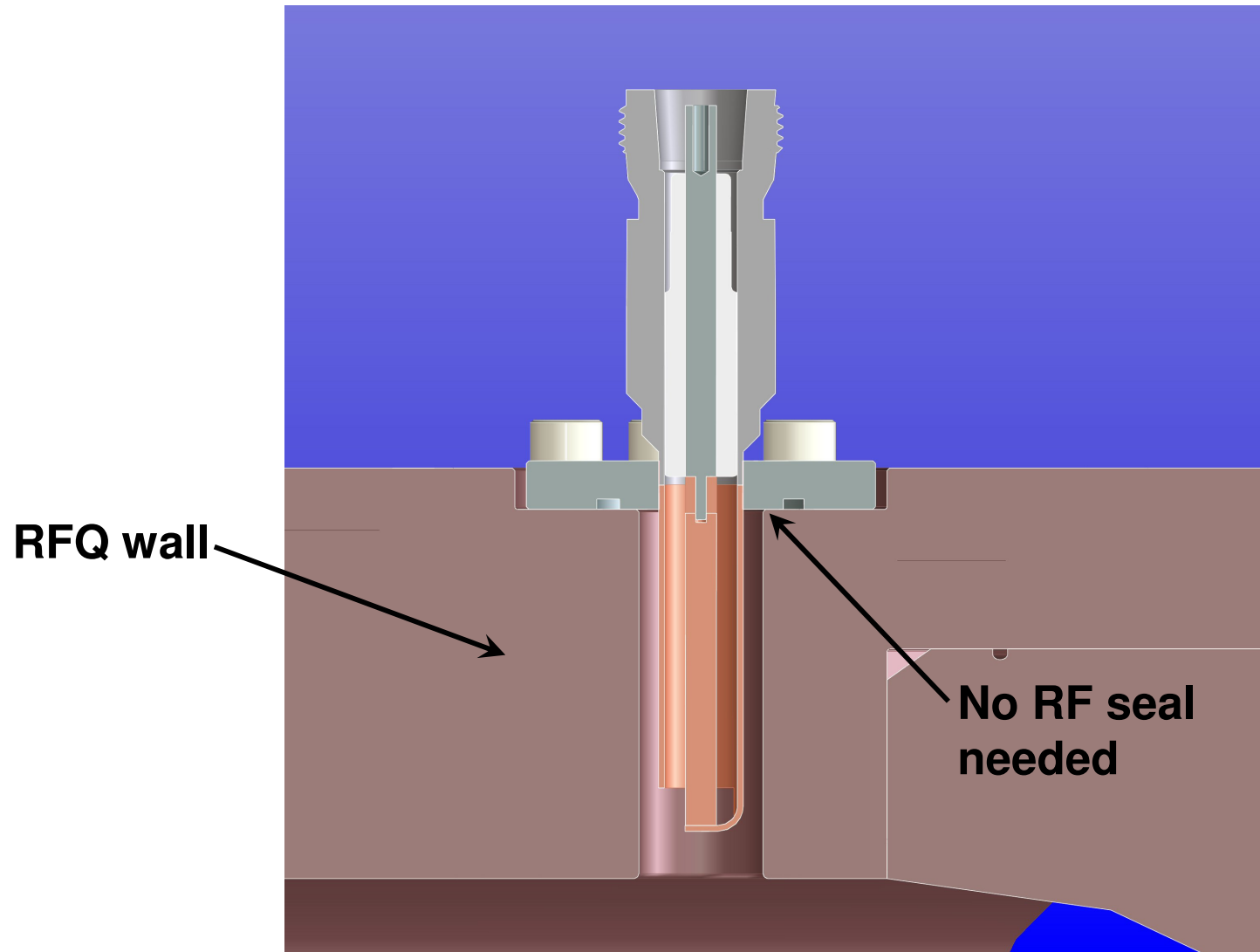
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- Detailed design completed by LBNL
- Uses an off-the-shelf Type N connector assembly
- Quote obtained from Ceramtec for full assemblies (~\$400 each)
- 48 each required for full RFQ

# RF Sensing Loop Design



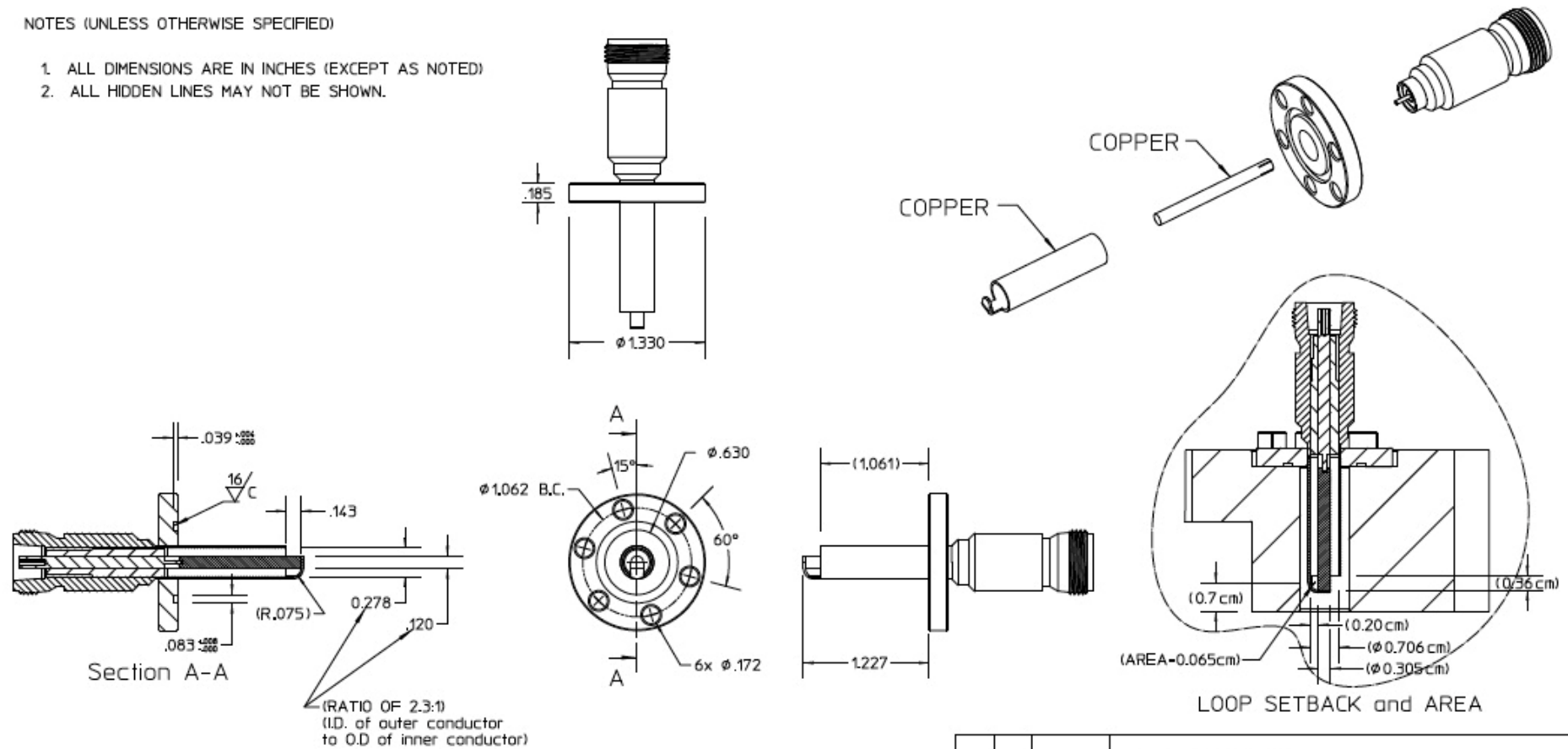
# Installed RF Sensing Loop



# RF Sensing Loop Drawing

NOTES (UNLESS OTHERWISE SPECIFIED)

1. ALL DIMENSIONS ARE IN INCHES (EXCEPT AS NOTED)
2. ALL HIDDEN LINES MAY NOT BE SHOWN.



REV	ITEM	PART NO.	DESCRIPTION
			Circumscribed PERCUT THROUGH ASSY 20130531
			PROJECT NAME: GENERAL
			PROJECT NUMBER: NONE
			ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY UNIVERSITY OF CALIFORNIA
			FNAL PXIE 162.5MHz RFQ
			RF SENSOR
			ASSEMBLY DRAWING FOR QUOTE
			1 SHEET OF 1
			SIZE: B
			DWG NO: 27J111
			REV A

# Adjustable Bead Pull Tuners

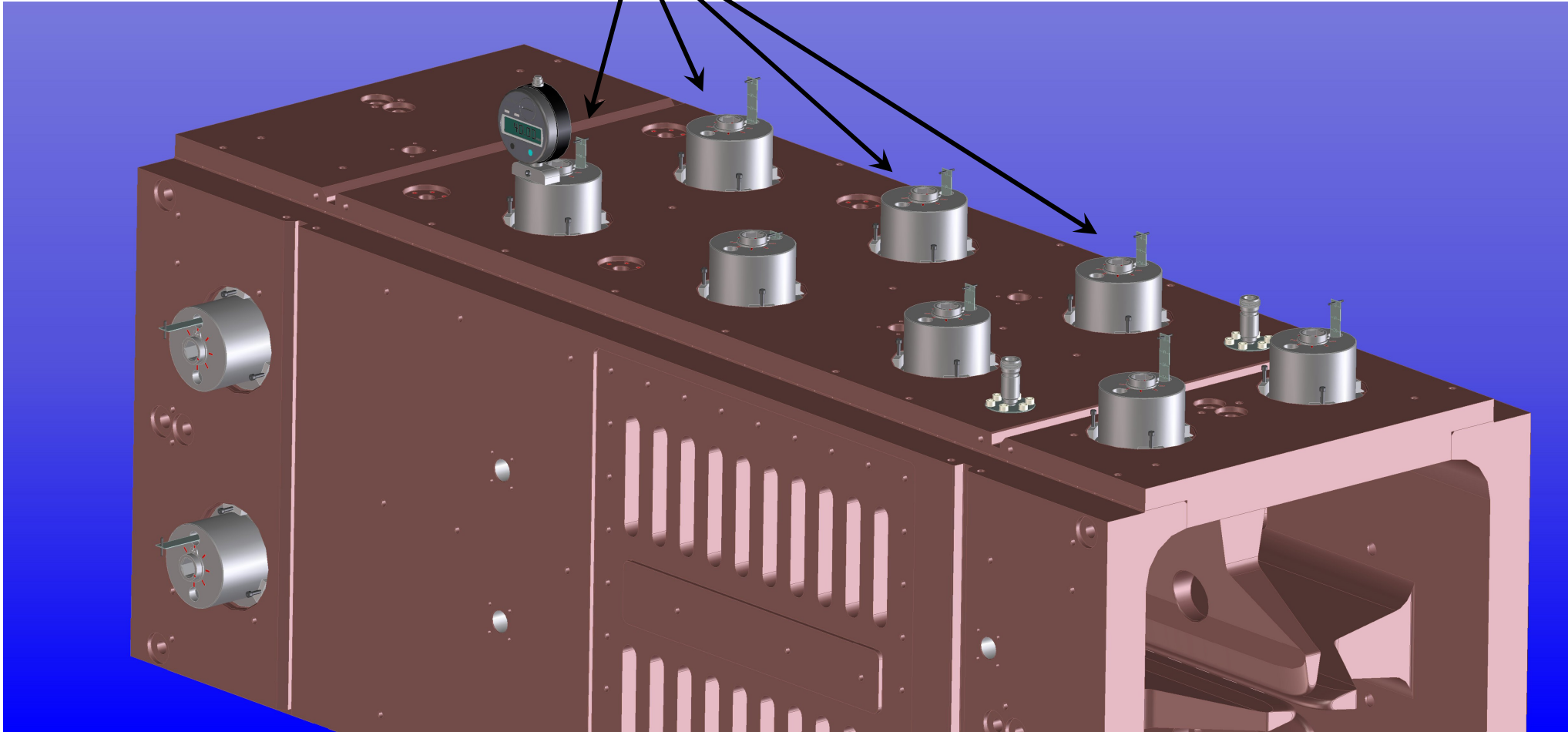
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- Used for single module and full RFQ bead pulls
- 80 each required for the 4-module RFQ
- Adjustment with external bolt
- Position determined by external scale and/or depth gauge
- RF seal only - no vacuum
- Drawings complete - prototype soon



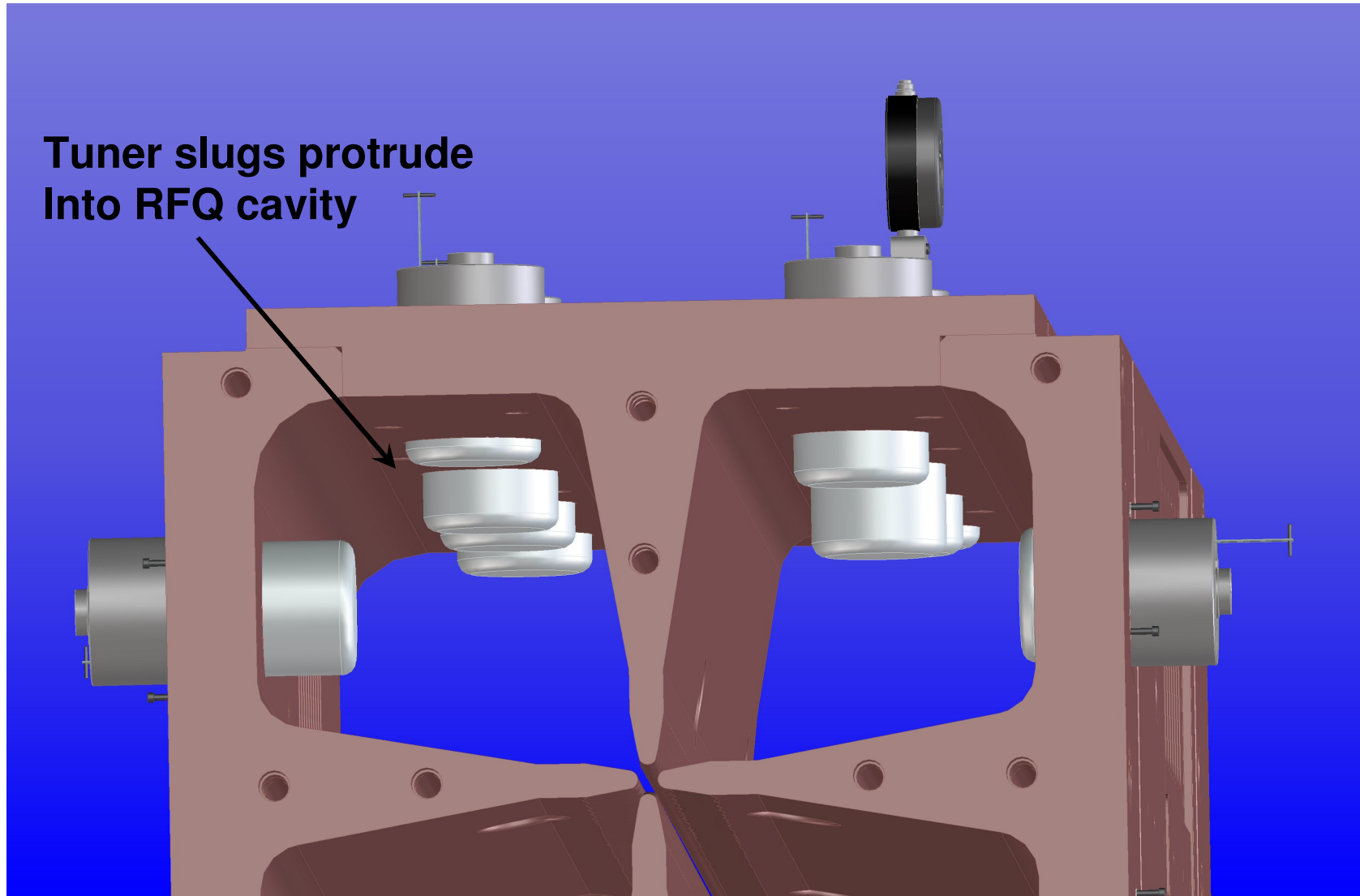
# Adjustable Bead Pull Tuners

Installed tuners



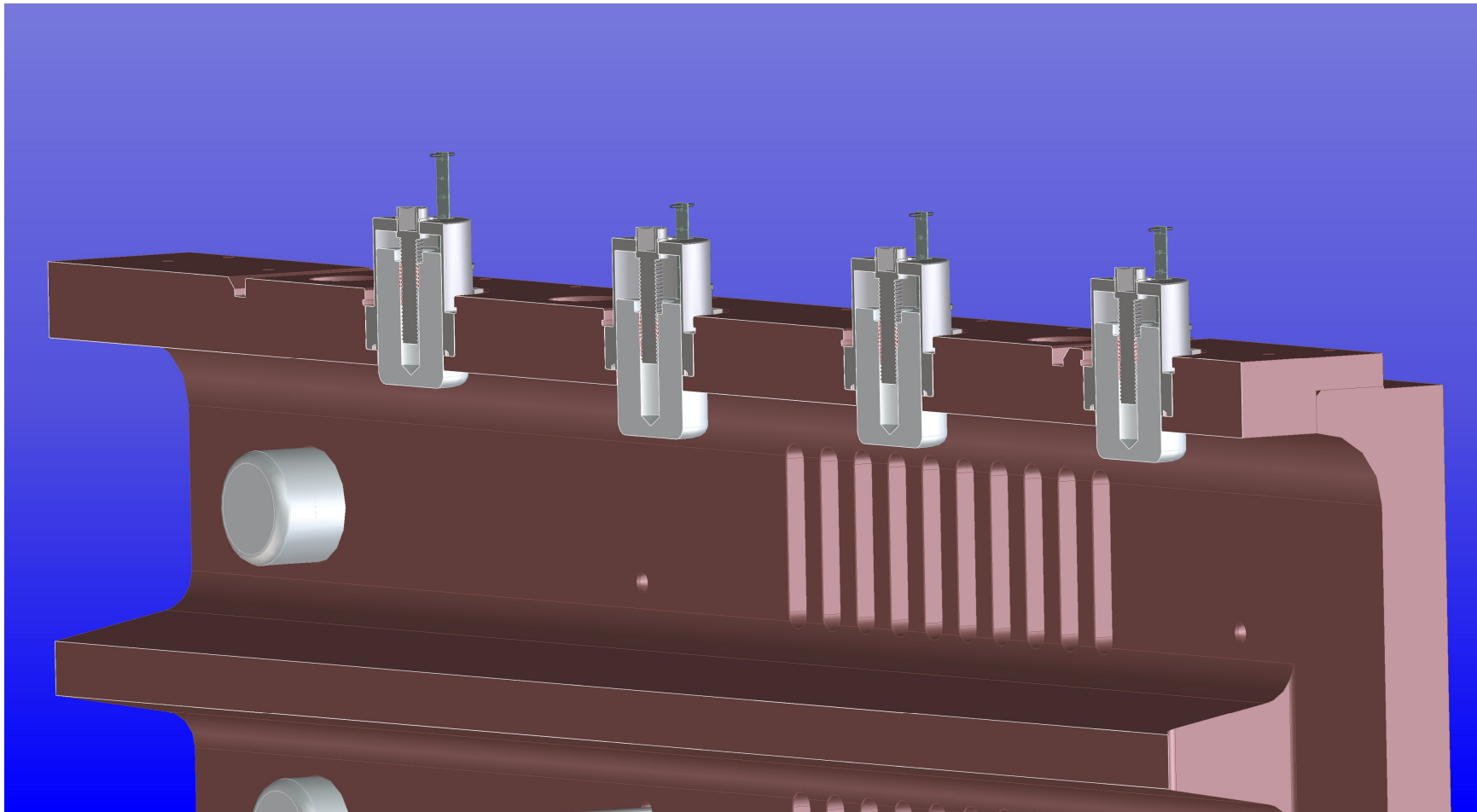


# Adjustable Bead Pull Tuners

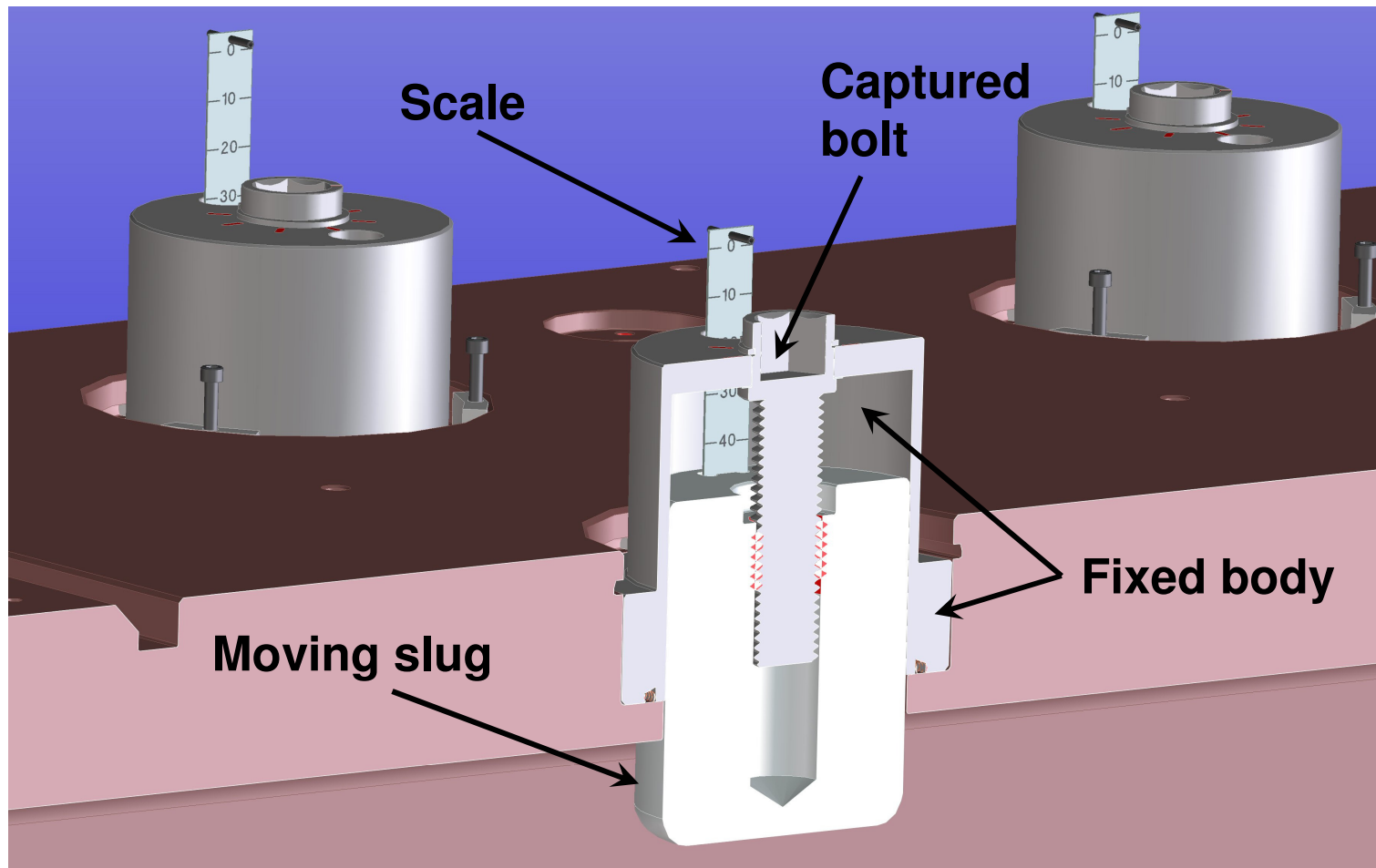


# Adjustable Bead Pull Tuners

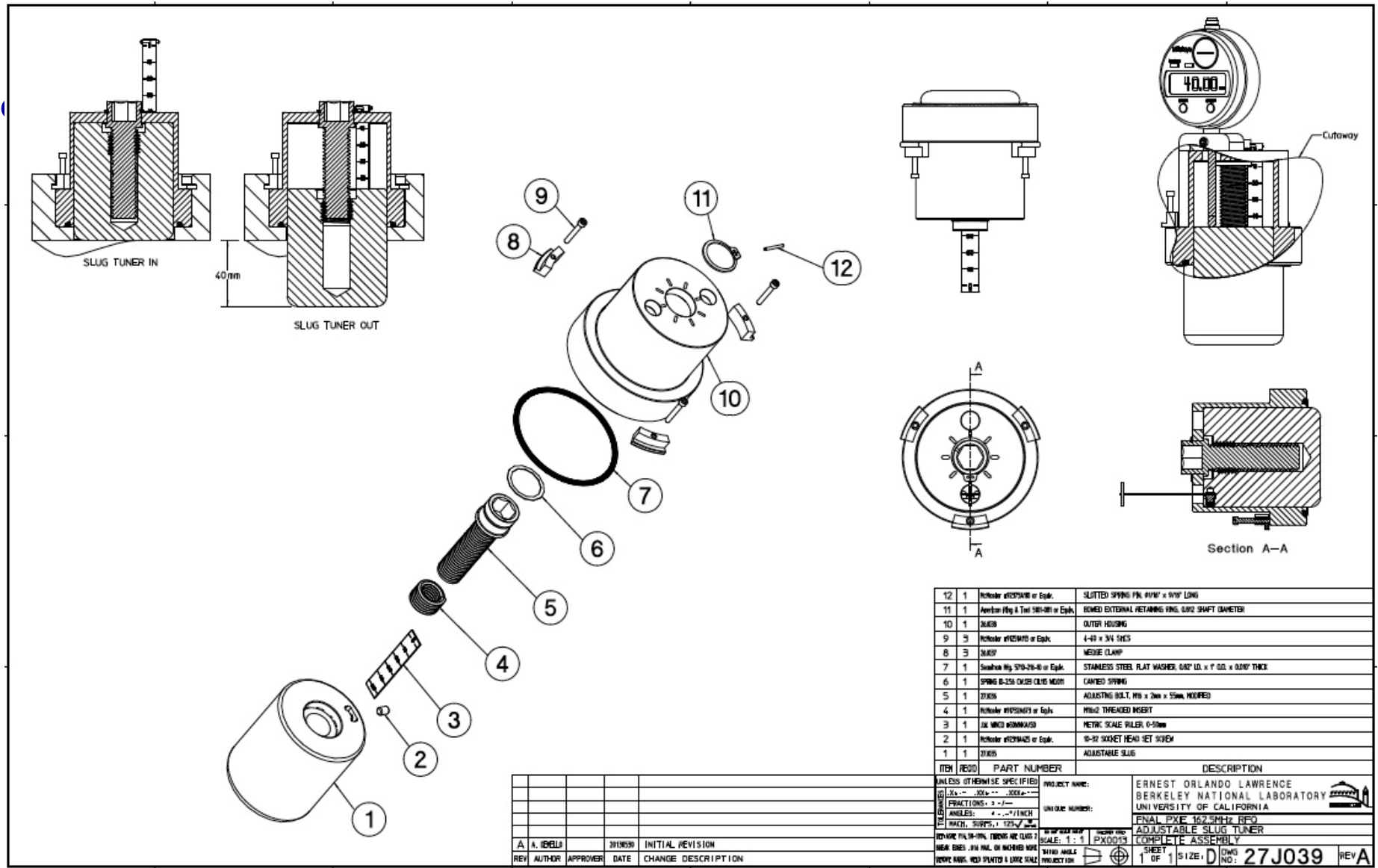
## Section view of installed tuners



# Adjustable Bead Pull Tuners



# Adjustable Tuner Assembly Dwg

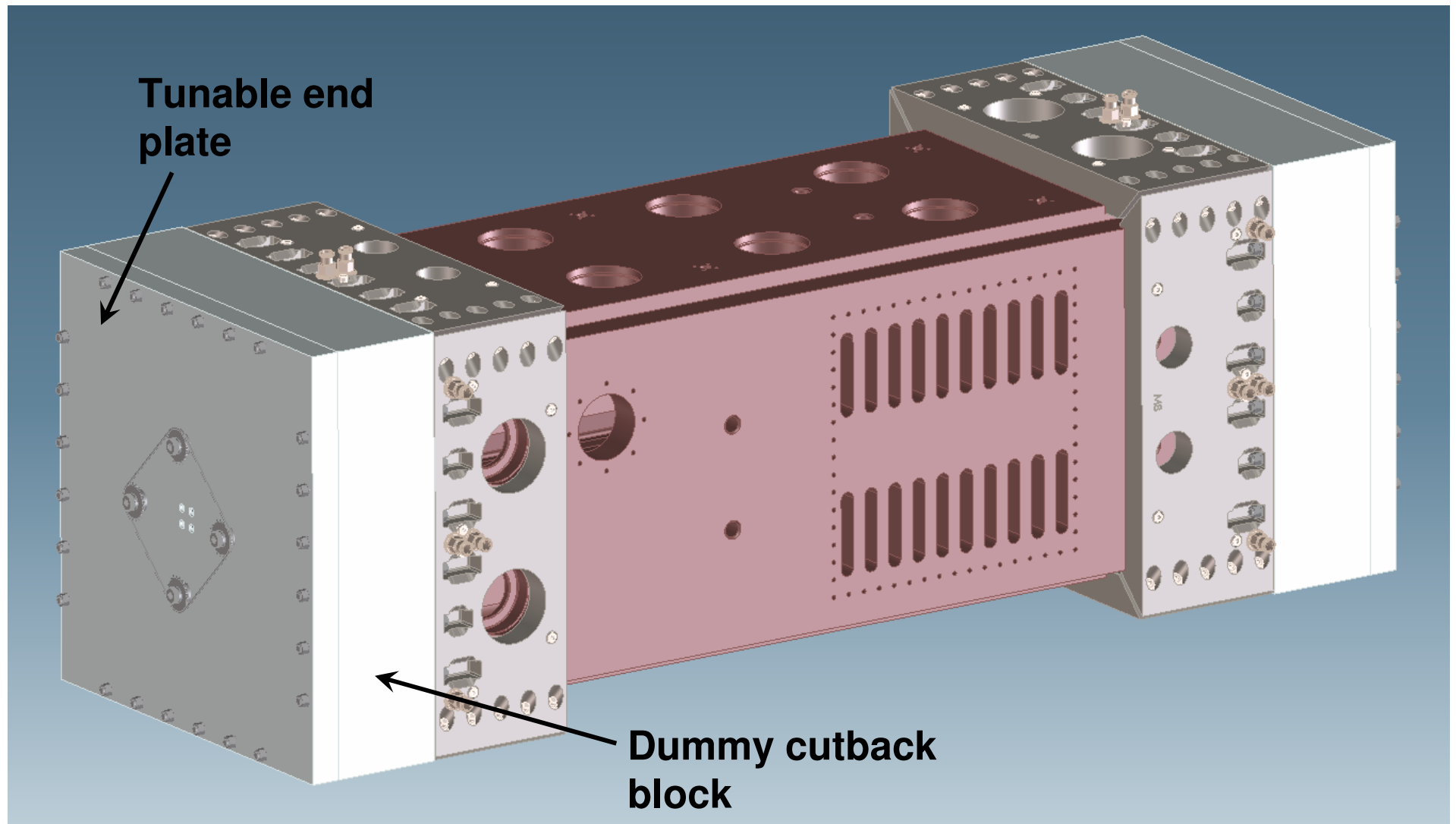


# Tunable End Plates

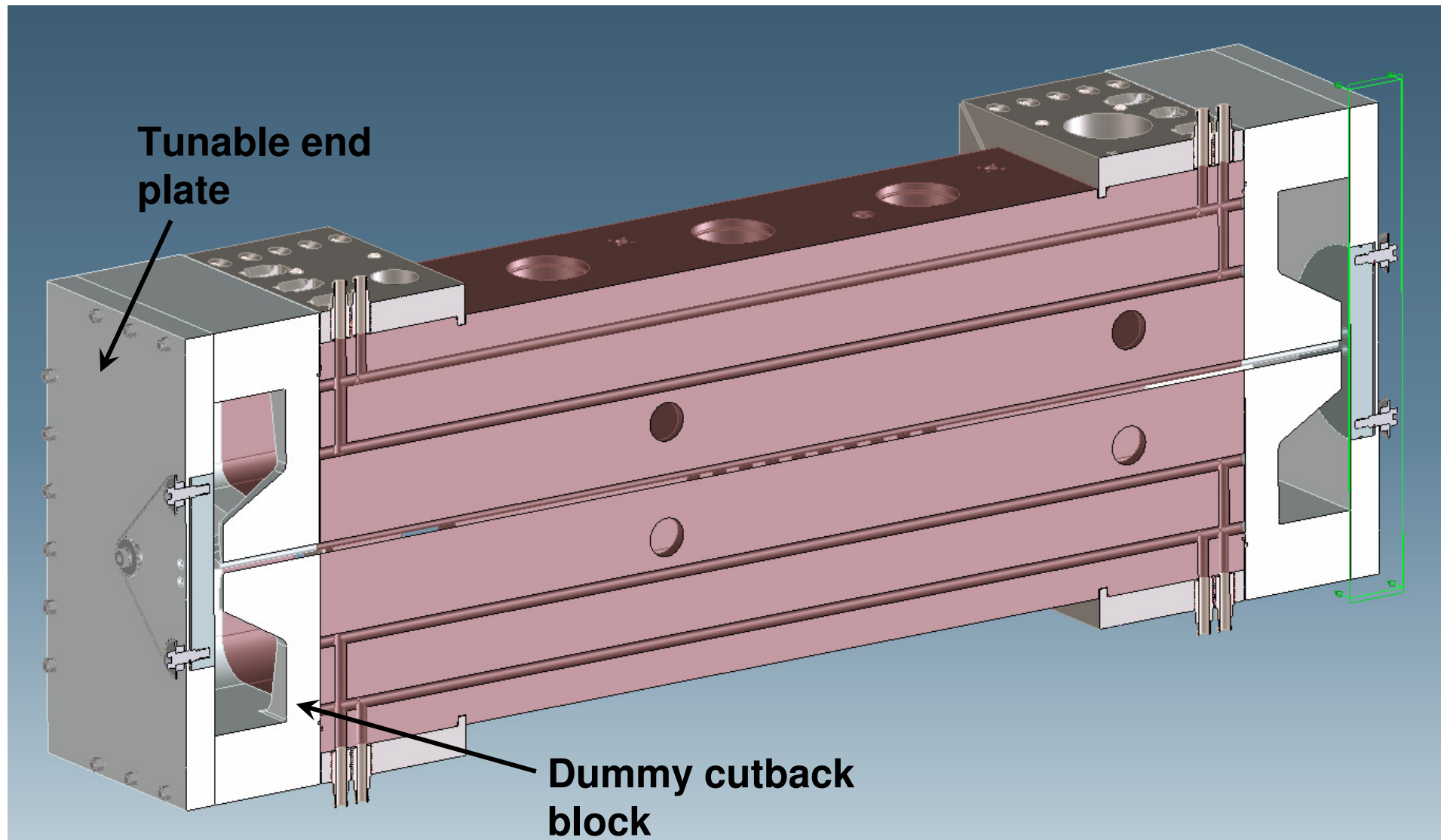
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- Allows for end frequency adjustment during single/full module bead pulls
- Used with cutback blocks for inner modules
- Adjustment with four external bolts linked by sprockets/chain
- RF seal only - no vacuum
- Drawings still to be done

# Tunable End Plates

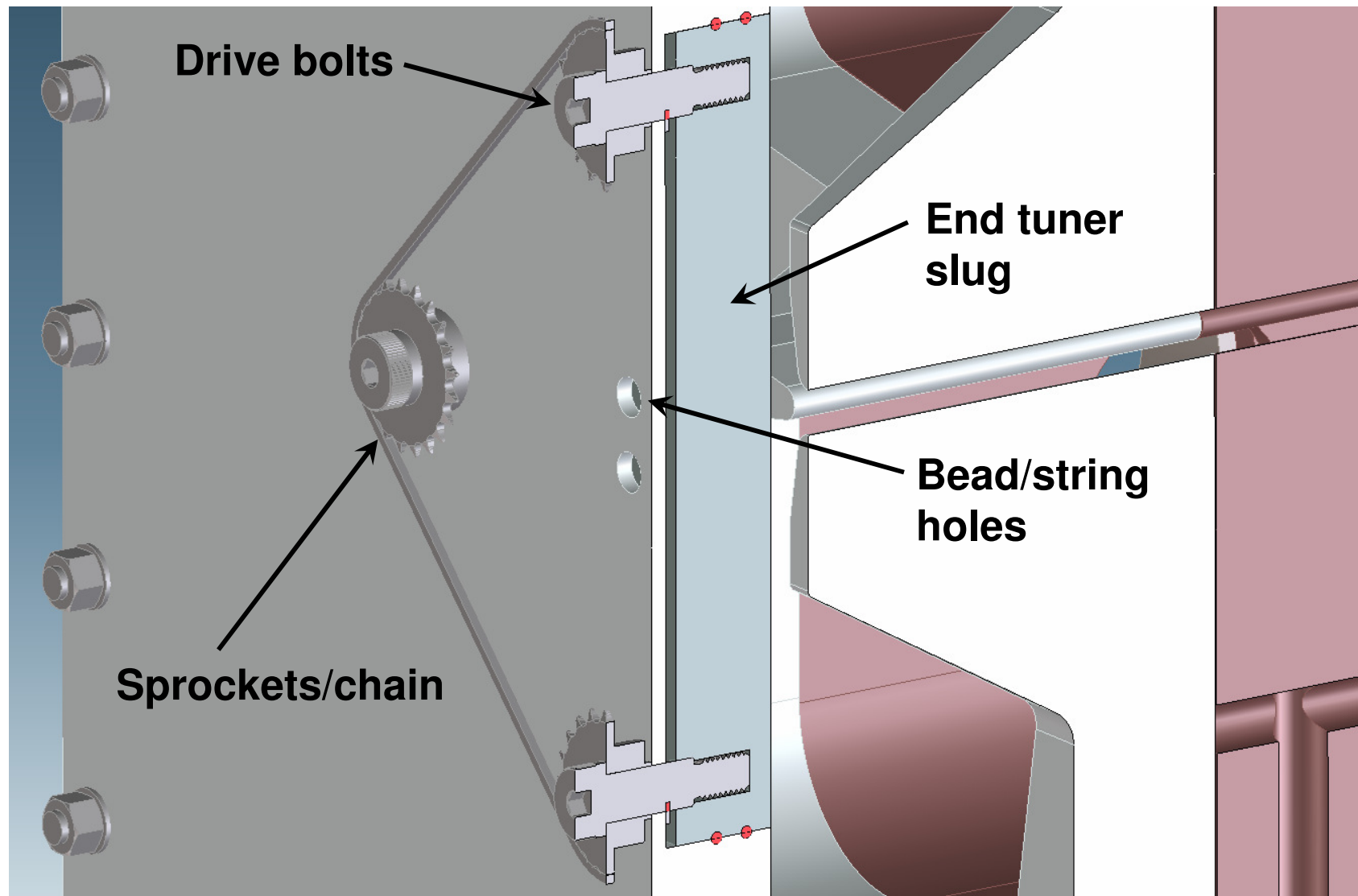


# Tunable End Plates



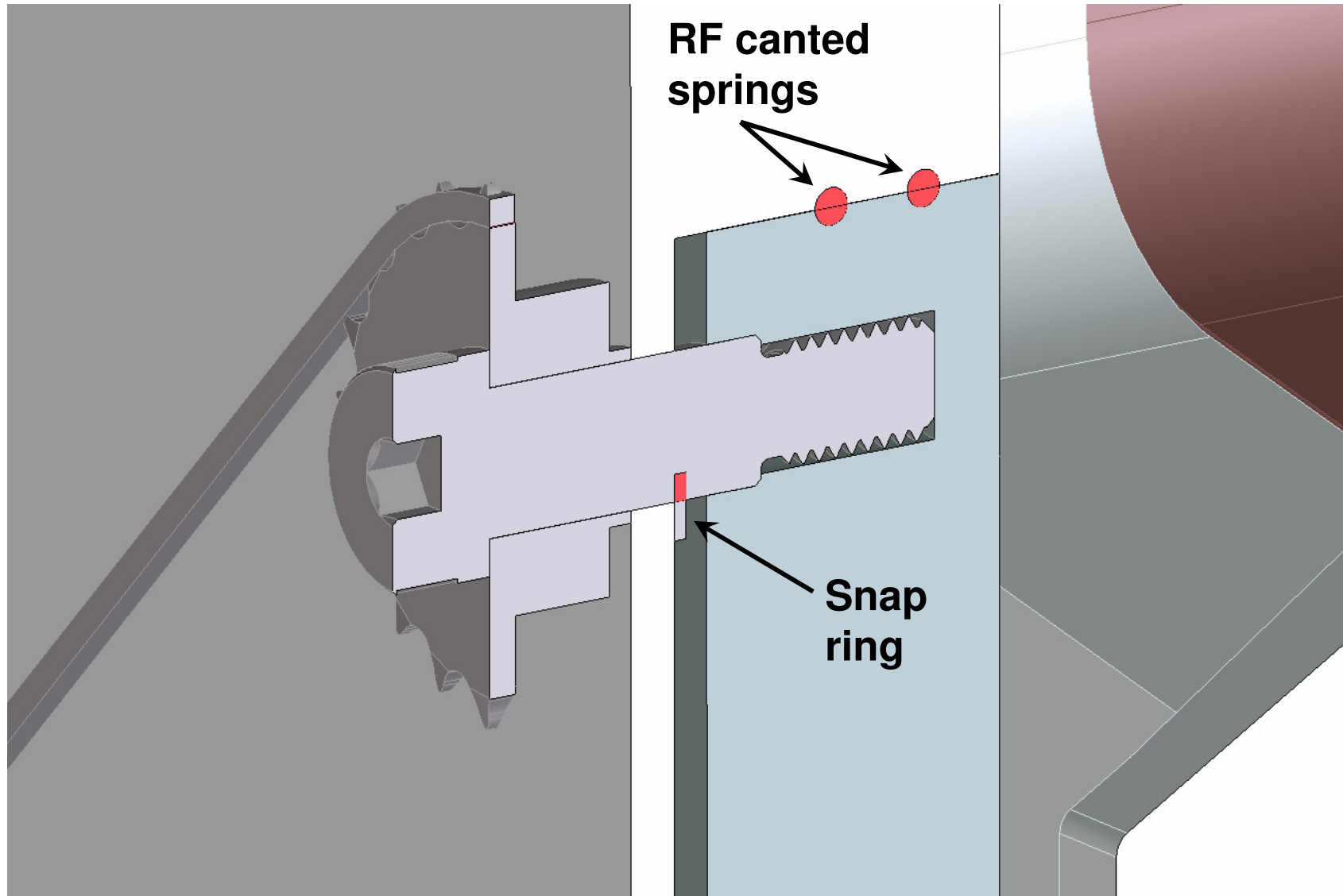


# Tunable End Plates





# Tunable End Blocks

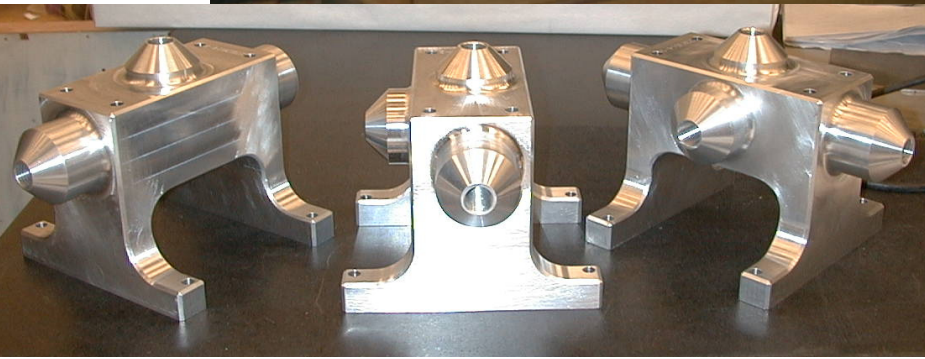
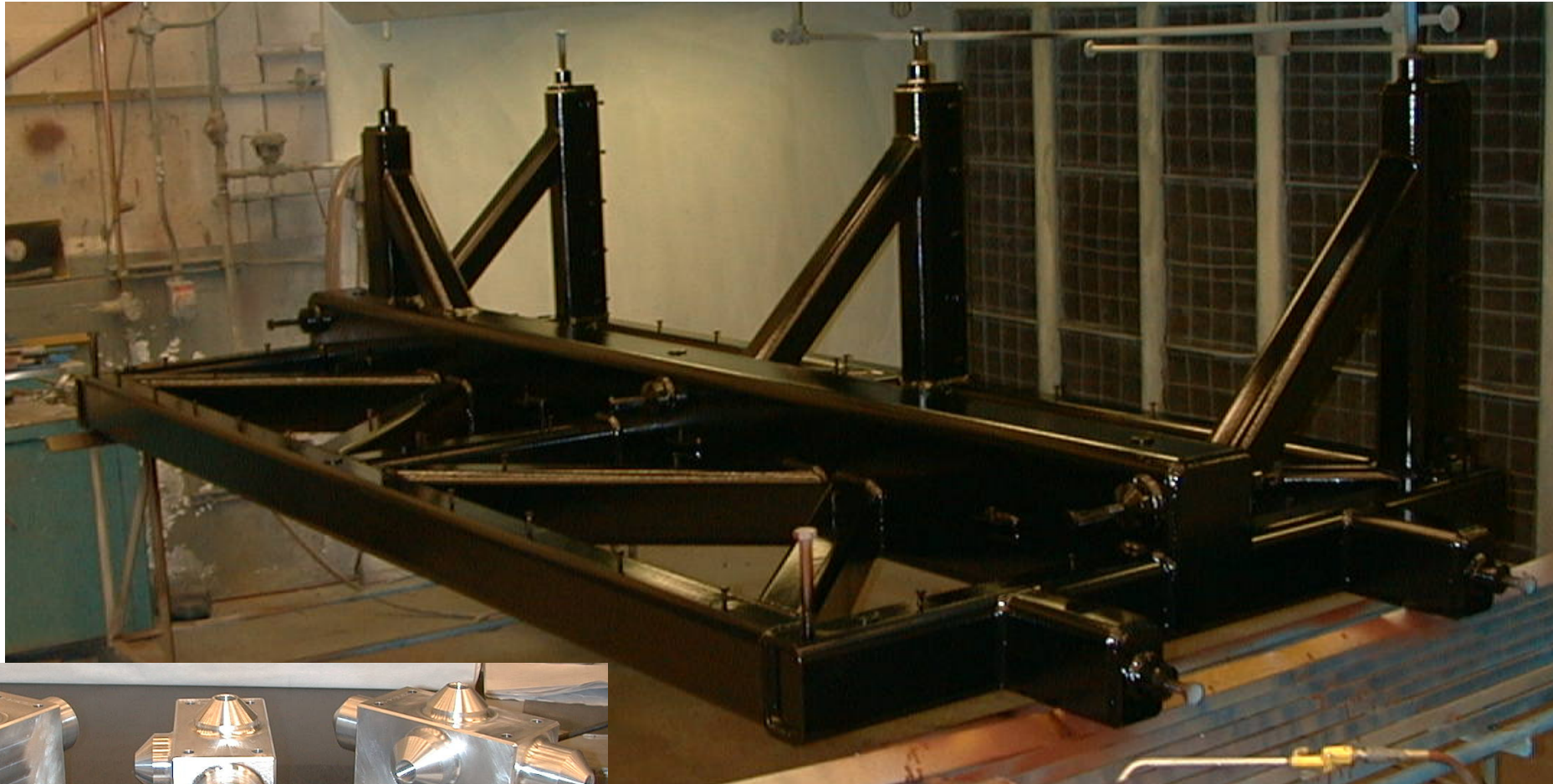


# 6-Strut Support Structure

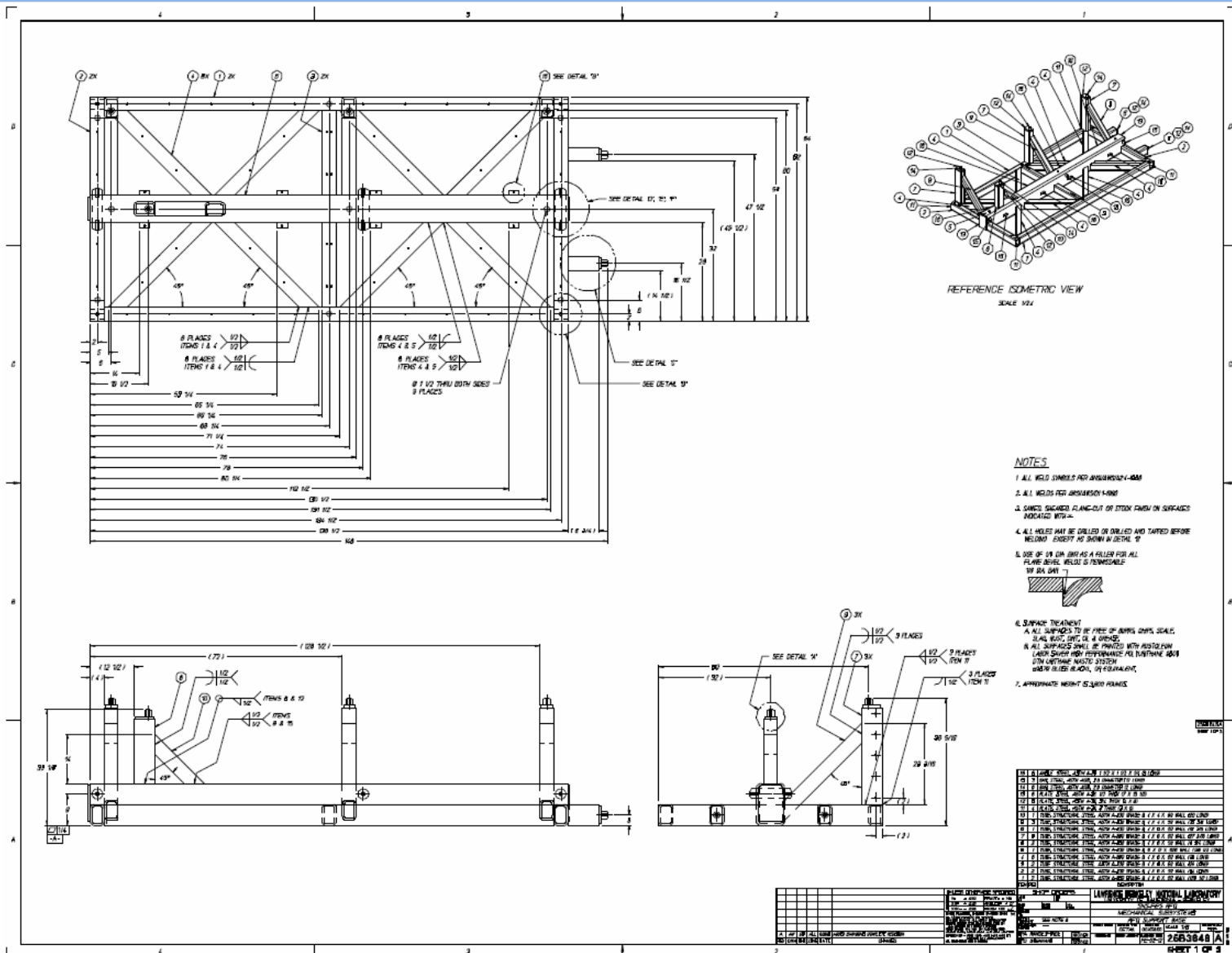
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- Similar idea used on SNS RFQ
- Connected RFQ modules behave as a single rigid body
- Easy alignment and positioning
- Non-redundant support - no thermal or mechanical loads imparted (kinematic)
- Inexpensive - welded tubular steel
- Scheme being developed to allow assembly of modules in place on support

# SNS RFQ Support w/Strut Bosses

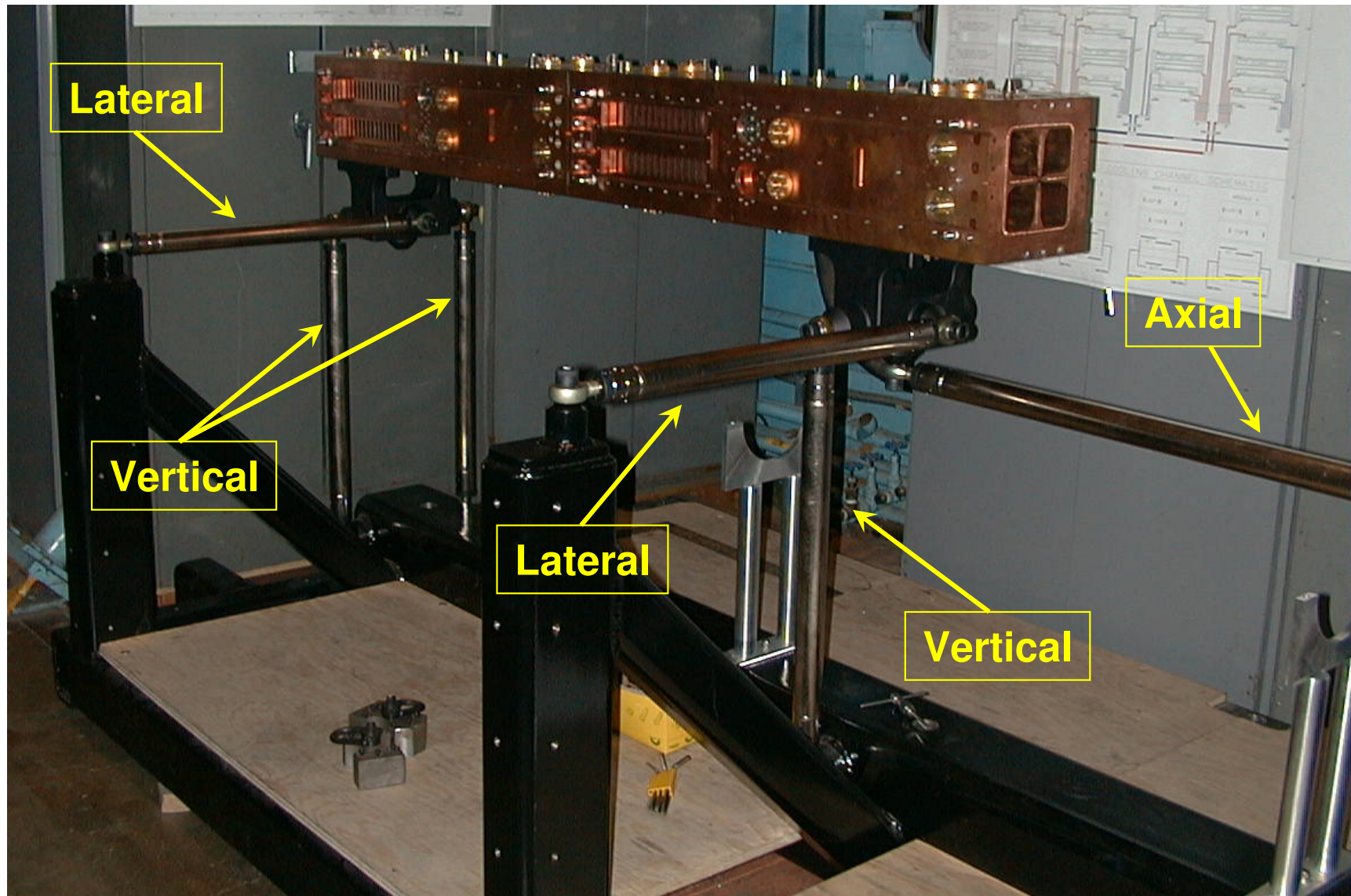


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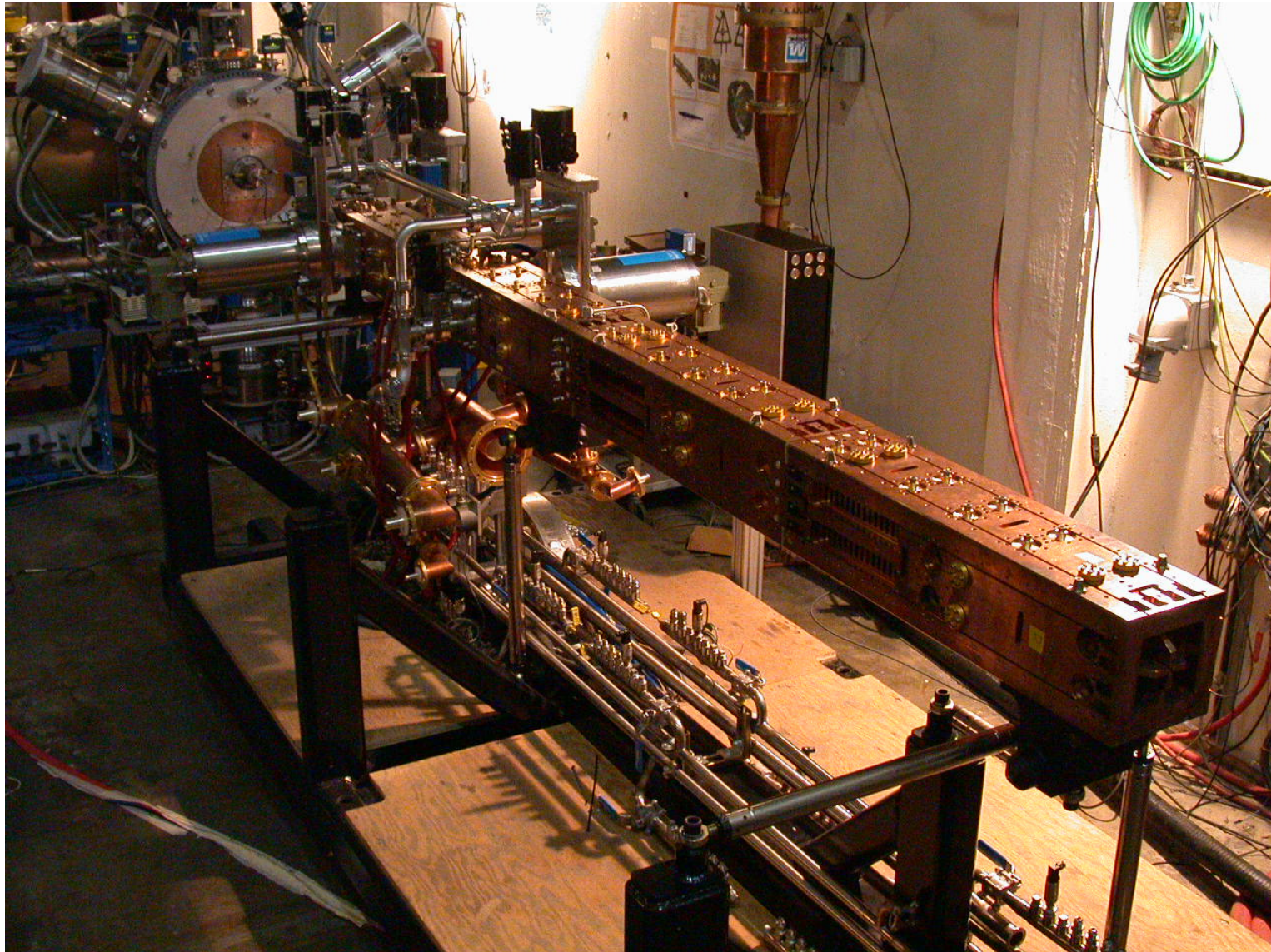


# Two SNS Modules in Place





# Full SNS RFQ on Six Struts



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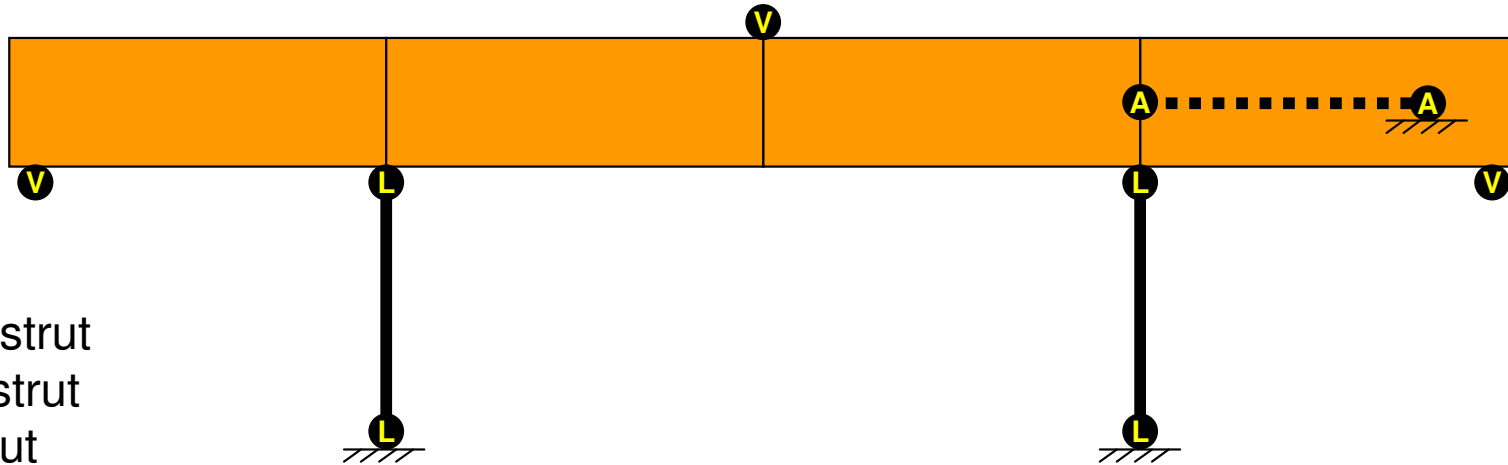
# Support Scheme

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- For heavy hardware w/orthogonal struts, use 3 vertical, 2 lateral and 1 axial strut
- 3 vertical struts not coplanar and are spread along length to minimize bending
- Sets of lower load struts can be used for each module during assembly on stand
- Redundant struts can be added for extra support during shipping of assembled RFQ

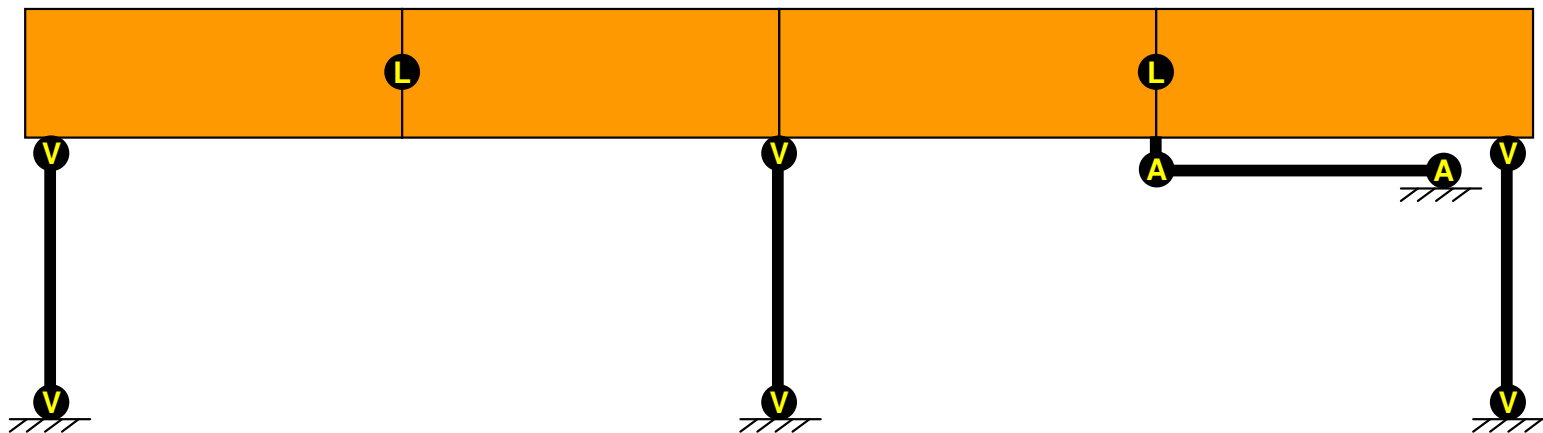
# 6-Strut Support Scheme

TOP VIEW



- V: Vertical strut
- L: Lateral strut
- A: Axial strut

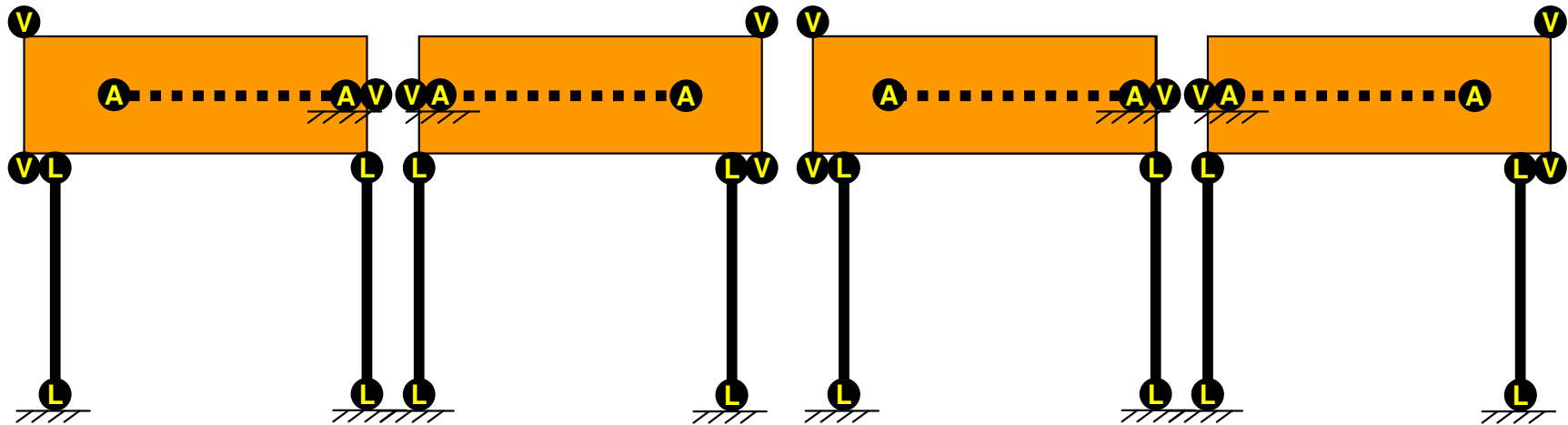
SIDE VIEW





# Individual 6-Strut Assembly Scheme

## TOP VIEW



## SIDE VIEW

